APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/747,054	12/22/2000	Dov Bulka	40921/206279	1574

26108 7590 06/22/2004	EXAMINER
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SUITE 200 GENERATION PLAZA	

ART UNIT	PAPER NUMBER
2175	19

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DATE MAILED: 06/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.		Applicant(s)
Office Action Summary	09/747,054		BULKA ET AL.
	Examiner		**Art Unit**
	Tony Mahmoudi		2175

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on _06 April 2004_.

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) _4 and 14-18_ is/are pending in the application.

     4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) _4 and 14-18_ is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

     a) ☐ All   b) ☐ Some * c) ☐ None of:

       1. ☐ Certified copies of the priority documents have been received.

       2. ☐ Certified copies of the priority documents have been received in Application No. _____.

       3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

     * See the attached detailed Office action for a list of the certified copies not received.

DOV POPOVICI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _18_.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37

CFR 1.17(e), was filed in this application after final rejection. Since this application is

eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR

1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn

pursuant to 37 CFR 1.114. Applicant's Request for Continued Examination (RCE)

submission filed on 06-April-2004 has been entered. In addition, the "After Final"

amendment filed on 06-April-2004 has been entered for the continued examination of this

application.

Remarks

2. In response to communications filed on 06-April-2004, claims 1-3 and 5-13 have been

cancelled, and new independent claims 16-18 have been added per applicant's request.

Therefore, claims 4 and 14-18, all in independent form, are presently pending in the

application.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4.   Claim 4 is rejected under 35 U.S.C. 102(b) as being anticipated by Johnson et al (U.S. patent

No. 5,151,989).)

As to claim 4, Johnson et al teaches a method of accessing files in a file access system

(see Abstract), comprising:

establishing a field in a directory i-node memory structure for files (see column 13, lines

52-59, and see column 17, line 64 through column 18, line 8) corresponding to a directory

cache hash table (see column 20, line 63 through column 21, line 11), the field containing a

pointer to the directory cache hash table (see column 18, lines 17-22, and see column 22,

lines 35-48);

reading a directory into buffer cache (see column 2, lines 33-55, where "reading a

directory into buffer cash" is read on "local caching", and "local buffer", and see column 8,

lines 9-22), the directory having a storage device representation (see column 9, lines 58-61,

where "storage device representation" is read on "the disk");

converting the directory from the storage device representation to a faster representation

(see column 17, lines 46-63, where "faster representation" is read on "caching" in order to

"speed up searching"), the faster representation representing a layout of the directory (see

column 25, line 30 through column 26, line 9, where "representing a layout of the directory"

is read on "storing units of directory information") with an array of hash buckets (see figures

19-20, and see column 17, lines 61-63) which point to a list of files which may correspond to

a specific i-node (see figure 20, see column 18, lines 9-22, and see column 22, lines 2-28);

and

searching the faster representation for a requested file (see column 8, lines 20-23) by

hashing the file i-node to a specific bucket which contains a list of files that may correspond

to the requested file i-node (see figure 20, and see column 18, lines 9-22, also see column 22,

lines 2-28);

wherein the storage device representation is maintained for backwards compatibility with

pre-existing and older file access systems (it is inherent that files kept on disks, CDs, or other

type of storage device representation are kept for the purpose of maintaining compatibility

with pre-existing and older file access systems.)

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness

rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

6. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson et

al (U.S. patent No. 5,151,989) in view of Saks et al (U.S. Patent No. 5,666,532.)

As to claim 14, Johnson et al teaches a computer server system (see Abstract, and see

column 5, lines 52-68, where "server system" is taught), comprising:

an outer cabinet housing memory, an array of storage devices, at least one power supply

providing electrical power to the computer server system (it is inherent that a "server system"

has "an outer cabinet housing memory, an array of storage devices, at least one power supply

providing electrical power to the computer server system"), and

at least one processor (see column 1, lines 41-50) allocating memory for directory cache

(see Abstract, and see column 5, lines 61-68, where "allocating memory" is read on

"formerly stored directory cache"), the processor converting directories from a storage device

layout to a faster representation which includes an array of hash buckets (see figures 19-20,

and see column 17, lines 61-63) which point to a list of files which may correspond to a

specific i-node, the faster representation including a pointer from a directory i-node memory

structure to an associated hash table (see figure 20, see column 18, lines 9-22, and see

column 22, lines 2-28.)

Johnson et al does not teach: allocating memory for buffer cache (although Johnson et al

teaches "local caching" in the BACKGROUND ART section of his invention (see column 2,

lines 33-55.)

Saks et al teaches a computer method for ordered operations (see Abstract), in which he

teaches allocating memory for buffer cache (see column 6, lines 23-32.)

Therefore, it would have been obvious to a person having ordinary skill in the art at the

time the invention was made to have modified Johnson et al to include allocating memory for

buffer cache.

It would have been obvious to a person having ordinary skill in the art at the time the

invention was made to have modified Johnson et al by the teaching of Saks et al, because

allocating memory for buffer cache would enable the system to store data locally and at a

faster rate, in which case, "pages that contain file data are used directly as the I/O buffers,

while file system structural data are held in the buffer cache", as taught by <u>Saks et al</u> (see

column 6, lines 32-35.)

As to claim 15, <u>Johnson et al</u> teaches a network (see Abstract) storage system (see

column 14, lines 1-9, where "storage system" is read on "disk.)

For the remaining steps of this claim, the applicant is kindly directed to the remarks and

discussions made in claim 14 above.

7. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over <u>Johnson et al</u> (U.S.

patent No. 5,151,989) in view of <u>Saks et al</u> (U.S. Patent No. 5,666,532), as applied to claims

14-15 above, and further in view of <u>Ish et al</u> (U.S. patent No. 5,778,430.)

As to claim 16, <u>Johnson et al</u> teaches a method of searching a file access system (see

Abstract) for a requested file (see column 8, lines 9-22), comprising:

establishing a field in a directory i-node memory structure for files (see column 13, lines

52-59, and see column 17, line 64 through column 18, line 8) corresponding to a directory

cache hash table (see column 20, line 63 through column 21, line 11), the field containing a

pointer to said directory cache hash table (see column 18, lines 17-22, and see column 22,

lines 35-48);

allocating memory for a directory cache hash table (see column 5, lines 61-68, where

"allocating memory" is read on "stored directory cache") having an array of hash buckets

(see figures 19-20, and see column 17, lines 61-63) which point to a list of files which may

correspond to a specific i-node (see figure 20, see column 18, lines 9-22, and see column 22, lines 2-28), the directory cache hash table storing directory layouts (see column 25, line 30 through column 26, line 9, where "storing directory layouts" is read on "storing units of directory information"), and the step of allocating memory for the directory cache hash table including selecting directories to cache using at least one of the number of files in a directory (see column 9, line 55 through column 10, line 3, see column 20, lines 47-55, and see column 22, lines 35-48);

searching the directory cache hash table for a requested file by hashing the file i-node to a specific bucket which contains a list of files that may-correspond to the requested file i-node (see column 20, line 63 through column 21, line 11), and if the file name in the directory cache hash table is not found, conventionally searching file structures (see figure 22, and see column 20, lines 8-34, where "conventionally searching" is read on "performing remote lookup"); and

if the bucket contains a matching file name, pointing to where the name of the requested file is stored (see column 20, lines 8-34, and see column 21, line 11.)

Johnson et al does not teach: allocating memory for buffer cache (although Johnson et al teaches "local caching" in the BACKGROUND ART section of his invention (see column 2, lines 33-55.)

Saks et al teaches a computer method for ordered operations (see Abstract), in which he teaches allocating memory for buffer cache (see column 6, lines 23-32.)

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified <u>Johnson et al</u> to include allocating memory for buffer cache.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified <u>Johnson et al</u> by the teaching of <u>Saks et al</u>, because allocating memory for buffer cache would enable the system to store data locally and at a faster rate, in which case, "pages that contain file data are used directly as the I/O buffers, while file system structural data are held in the buffer cache", as taught by <u>Saks et al</u> (see column 6, lines 32-35.)

<u>Johnson et al</u> as modified, still does not teach frequency of use.

<u>Ish et al</u> teaches a method and apparatus for computer disk cache management (see Abstract), in which he teaches hashing selected directories into a hash table format (see column 5, lines 41-44) according to frequency of use (see column 6, lines 7-13.)

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified <u>Johnson et al</u> as modified, to include hashing selected directories into a hash table format according to frequency of use.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified <u>Johnson et al</u> as modified, by the teaching of <u>Ish et al</u>, because hashing selected directories into a hash table format according to frequency of use, would tailor the management of hashed data blocks to accommodate directories based on how frequently they are accessed.

8. Claims 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over <u>Johnson et al</u> (U.S. patent No. 5,151,989) in view of <u>Ish et al</u> (U.S. patent No. 5,778,430.)

As to claim 17, <u>Johnson et al</u> teaches a method of accessing files in a file access system (see Abstract), comprising:

establishing a field in a directory i-node memory structure for files (see column 13, lines 52-59, and see column 17, line 64 through column 18, line 8) corresponding to a directory cache hash table (see column 20, line 63 through column 21, line 11), said field containing a pointer to said directory cache hash table (see column 18, lines 17-22, and see column 22, lines 35-48);

reading a directory into buffer cache (see column 2, lines 33-55, where "reading a directory into buffer cash" is read on "local caching", and "local buffer", and see column 8, lines 9-22), the directory having a storage device representation (see column 9, lines 58-61, where "storage device representation" is read on "the disk");

converting the directory to a faster representation (see column 17, lines 46-63, where "faster representation" is read on "caching" in order to "speed up searching"), the faster representation including a pointer from the directory i-node to an associated hash table, the hash table containing a layout of the directory (see column 25, line 30 through column 26, line 9, where "representing a layout of the directory" is read on "storing units of directory information") with an array of hash buckets (see figures 19-20, and see column 17, lines 61-63) which point to a list of files which may correspond to a specific i-node (see figure 20, and see column 18, lines 9-22, also see column 22, lines 2-28);

hashing selected directories into a hash table format (see column 18, lines 17-22);

searching the faster representation for a requested file (see column 8, lines 20-23); and

wherein the storage device representation is maintained for backwards compatibility with

pre-existing file access systems (it is inherent that files kept on disks, CDs, or other type of

storage device representation are kept for the purpose of maintaining compatibility with pre-

existing and older files.)

Johnson et al does not teach hashing directories according to at least one of a size of the

directory, frequency of access, and a user selected criteria.

Ish et al teaches a method and apparatus for computer disk cache management (see

Abstract), in which he teaches hashing directories according to at least one of a size of the

directory (see column 5, lines 61-65), frequency of access (see column 6, lines 7-13), and a

user selected criteria (see column 5, lines 37-40, and see column 8, lines 28-37.)

Therefore, it would have been obvious to a person having ordinary skill in the art at the

time the invention was made to have modified Johnson et al to include hashing directories

according to at least one of a size of the directory, frequency of access, and a user selected

criteria.

It would have been obvious to a person having ordinary skill in the art at the time the

invention was made to have modified Johnson et al, by the teachings of Ish et al, because

including hashing directories according to at least one of a size of the directory, frequency of

access, and a user selected criteria, would enable the system to tailor the management of

hashed data blocks to accommodate directories with various data sizes, how frequently the

data is accessed, and based on directions provided by the user.

As to claim 18, <u>Johnson et al</u> teaches a method of searching a file access system (see Abstract) for a requested file (see column 8, lines 9-22), comprising:

establishing a field in a directory i-node memory structure for files (see column 13, lines 52-59, and see column 17, line 64 through column 18, line 8) corresponding to a directory cache hash table (see column 20, line 63 through column 21, line 11), the field containing a pointer to said directory cache hash table (see column 18, lines 17-22, and see column 22, lines 35-48);

allocating a hash table, the hash table having hash buckets which point to a list of files which may correspond to a specific i-node (see figure 20, see column 18, lines 9-22, and see column 22, lines 2-28);

hashing a directory into the hash table (see column 18, lines 17-22);

linking hash buckets to offsets where a name of the requested file is stored (see figure 20);

establishing a pointer for the directory (see column 13, lines 52-59, and see column 17, line 64 through column 18, line 8), the pointer pointing from a directory i-node to the hash table (see figure 20, see column 18, lines 9-22, and see column 22, lines 2-28); and

searching the hash buckets for a requested file (see column 20, line 63 through column 21, line 11);

For the teaching of "hashing directories according to at least one of a size of the directory and frequency of access", the applicant is kindly directed to the remarks and discussions made in claim 17 above, in view of teachings of <u>Ish et al</u>.

Response to Arguments

9. Applicant's arguments filed on 06-April-2004 with respect to the rejected claims in view of

the cited references have been fully considered but they are not deemed persuasive:

In response to the applicants' arguments that "the examiner may be misinterpreting the

teachings of the references in the context of the claimed invention", the arguments have been

fully considered but are not deemed persuasive, because the examiner notes that all cited

references are indeed in the same field of endeavor with the claimed invention. The primary

reference cited in this case, Johnson et al, teaches "a directory caching technique" for a "data

processing system" (see Abstract), which reads a directory into a buffer cache, where the

directory has a disk association (storage device representation), teaches I-node memory

structure (see column 13, lines 52-59) and directory hash tables (see column 18, lines 17-22),

and teaches conversion to a faster representation of the directory (see "caching in order to

speed up searching" in column 17, lines 46-63), which satisfies all the limitations of claim 4,

as well as a significant part of all other claims presently pending in the application.

In response to the applicants' arguments that certain teachings of the Johnson et al

reference have "nothing to do with the claimed invention", the arguments have been fully

considered but they are not deemed persuasive, because Johnson et al is not limited to the

teachings of the claimed invention. So long as the cited reference(s), alone, or in

combination, satisfies the limitations of the claimed invention, without teaching away from

the invention, the cited references are considered valid.

In response to the applicants' arguments that "there is no discussion of how directories to

cache are selected including the using of at least one of the number of files in a directory

and/or the frequency of use as it is recited in Applicants' claimed invention", the arguments

have been fully considered but are not deemed persuasive, because both of the newly added

claims 16 and 18, featuring the above limitation, recite: "selecting directories to cache using

at least one of the number of files in a directory and the frequency of use". The limitations of

claims 16 and 18 do not discuss *how* the directories are selected.

Conclusion

10. Any inquiries concerning this communication or earlier communications from the examiner

should be directed to Tony Mahmoudi whose telephone number is (703) 305-4887. The

examiner can normally be reached on Mondays-Fridays from 08:00 am to 04:30 pm.

   If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Dov Popovici, can be reached at (703) 305-3830.

tm

June 1, 2004

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